Data Center: Up and Running 24/7

Panel

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ABSTRACT

Data centers are becoming as one of the most promising IT fields. It is a collection of mechanical, technical, electrical and environmental, construction professionals, project managers and experts who challenge themselves to plan, build, and operate. Practitioners and academic researchers are paying attention to this field. Since the data center contains electronic equipment, power supplies, cabling, air conditioning, cooling, along with security and compliance issues, interdisciplinary and holistic approach should be conducted in data center research. This purpose of this data center panel session is to explore one of the research and teaching topics in information systems field.

Keywords
Data Center, Managerial Perspective, Security, Compliance, Best Practices

INTRODUCTION

Although the concept of data centers has been around since the late 1950s, today's data centers are shifting from an infrastructure, hardware, and software ownership model toward a subscription and capacity on demand model. Data centers and network have emerged as increasingly popular and broad information systems field. A data center is a centralized repository of computer systems and associated components that are used to collect, store, analyze, manage, and distribute data. Data centers are designed to fulfill one or more specific functions and are run by large companies, scientific organizations, or government agencies.

According to U.S. Environmental Protection Agency's *Report to Congress on Server and Data Center Energy Efficiency*, a data center contains electronic equipment used for data processing (servers), data storage (storage equipment), and communications (network equipment) (Arregoces and Portolani, 2003) (Geng, 2015). The equipment in data center consist of networking switches, servers, mass storage systems, specialized software, primary and backup power supplies, extensive cabling, environmental controls (i.e., power, air conditioning, cooling), and aggressive security protocols.

In the interest of personal, corporate, and government concerns, security at data centers takes an aggressive approach. Gate security, constant surveillance, metal detectors, and reinforced structures are common. In addition to the security issue, data centers must meet certain compliance in order to store information, e.g., payment card industry (PCI), Federal Financial Institutions Examination Council (FFIEC), National Institute of Standards and Technology (NIST), The Health Information Trust Alliance (HITA), Health Insurance Portability and Accountability Act (HIPAA)**,** Federal Risk and Authorization Management Program (FedRAMP), and Federal Information Security Modernization Act (FISMA). When considering a data center's operation and design, technical and managerial skills and expertise from strategic planning, technologies, design, operating efficiency, disaster recovery, and security are required.

Beginning in the early 1990s, the topic of data warehouse has received a great deal of attentions. The data warehouse remains a 'hot' topic in corporate and academic computing publications. A recent paper showed that 2.5 exabytes of data created every day (McAfee and Brynjolfsson, 2012). The first big data center was built in the mid-1960s when the U.S. government had to store 742 million tax returns and 175 million sets of fingerprints (Shim et al., 2016). As shown in Table 1, there are numerous data center types.

Table 1. Data Center Types

In-House / Enterprise data center	Colocation / party data center	Wholesale Data Center	Dedicated Hosting	Managed Hosting	Shared Hosting
Enterprises typically have their primary data centers located at or near their corporate headquarters facility where the IT team is located.	Multi-tenant data centers or colocation spaces can be sold to enterprises by the rack, cabinet or cage.	These providers sell data center space in larger capacities than a colocation model and typically have fewer customers.	The provider operates and/or rents server capacity to single customers. In other words, servers are not shared among multiple customers. No additional services are provided and the customer maintains full control over the server beyond maintenance.	The provider operates servers and storage for its customers, as well as provides additional administrative and engineering services, although the scope of services can be diverse and extensive among various providers.	These service providers have customers sharing server capacity to deploy services; these providers create multi-tenant applications to help customers configure their services.

Sources:
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The primary purpose of this panel is to explore research and teaching topics of data centers in the information systems field. Since a data center contains servers, storage equipment, network equipment, power supplies, cabling, air conditioning, cooling, along with security and compliance issues, interdisciplinary and holistic approach should be conducted. The questions and issues the panel session will cover: 1) current Status, overview, issues of data center and networking, 2) evolution of data center, security, and compliance issues, 3) data warehouse, data lake, and data center, role and managerial issues of data center, and educational perspectives of data center, 4) Best practices (power supply chain, cooling, potential technology solutions, and key benefits) of data center, and 5) Strategic perspective and future of data center

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Before joining Georgia State University as faculty in 2011, Dr. Shim was a Larry and Tonya Favreau Notable Scholar and Professor of Info Systems at Mississippi State University. He taught at MSU, NYU, Chinese U of Hong Kong, and GSU. He serves on Wireless Telecom Symposium as program chair and served on 2013 AMCIS as program co-chair. He has received grants, including NSF, Microsoft, Booz-Allen, SBA, Mississippi IHL. His research interests are speech analytics and data center.

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Dr. French is currently teaching MIS at University of New Mexico. His research interests are social networking, big data and data warehousing, cross-cultural studies, diversity, and eCommerce. He has received Outstanding Teacher of the Year awards from Mississippi State University and Kyungpook National University. Dr. French has his own social networking company.

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He is a Professor of Information Systems and Associate Dean of Research at Arizona State University. Over the past 31 years, he was faculty and department chair at Department of Information Systems at Arizona State University. His research interests center on the big data, analytics, data warehouse, and data center.

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CONCLUSION

The data center is becoming one of the most popular and promising information systems fields. Recently, practitioners and academic researchers have been paying increased attention to data center and network for innovation, collaborating and building a better web. An holistic and interdisciplinary approach should be conducted in the field of data center research, especially managerial, technical, security, compliance and requirement.

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